AD-A190 115 ENHANCEMENT OF DATA ACQUISITION AND NUMERICAL COMPUTATION CAPABILITIES FO.. (U) STATE UNIV OF NEW YORK AT ALBANY RESEARCH FOUNDATION W K GEORGE 20 OCT 87 1/1

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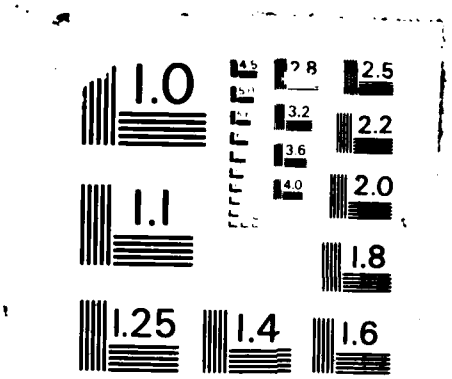

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ORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION: UNCLASSIFIED	1b. RESTRICTIVE MARKINGS: Unrestricted.
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT: Unlimited. Approved for Public Release
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S): AFOSR-TR- 87-1788
6a. NAME OF PERFORMING ORGANIZATION: Research Foundation of State University of New York; 6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION: AFOSR/NA
6c. ADDRESS (City, State and ZIP Code): P.O. Box 9, Albany, New York 12201	7b. ADDRESS (City, State and ZIP Code): Building 410, Bolling AFB, DC 20332-6448
8a. NAME OF FUNDING/SPONSORING ORGANIZATION: AFOSR; 8b. OFFICE SYMBOL (If applicable): AFOSR/NA	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER: AFOSR-86-0209
8c. ADDRESS (City, State and ZIP Code): Building 410, Bolling AFB, Washington, D.C. 20332-6448	10. SOURCE OF FUNDING NOS.

PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT NO.
61102F	2917	A1	

11. TITLE (Include Security Classification): (U) Enhancement of Data Acquisition and Numerical Computation Capabilities

12. PERSONAL AUTHOR(S): William K. George

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Yr., Mo., Day)	15. PAGE COUNT
Final	FROM 5/26/86 TO 5/25/87	87/10/20	4

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB. GR.	Data Acquisition, Computers

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

Abstract

A significant improvement in the data acquisition and numerical computation capabilities of the Turbulence Research Laboratory was achieved by: (i) the upgrading of the data acquisition system to a PDP 11/84, (ii) the addition of a micro VAX work station, and (iii) the upgrading of the central computing array processor. All facilities are linked with Ethernet thereby providing for very high speed data links from the laboratory to the VAX Cluster and Array Processor. Also, the facilities are linked by NYSERNET (59k baud) to the NSF supercomputer network.

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20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT ☐ DTIC USERS ☐	Unclassified

22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE NUMBER (Include Area Code)	22c. OFFICE SYMBOL
James D. Wilson	(202) 767-4987	AFOSR/NA

DD FORM 1473, 83 APR EDITION OF 1 JAN 73 IS OBSOLETE

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SECURITY CLASSIFICATION OF THIS PAGE

Enhancement of Data Acquisition and Numerical Computation
Capabilities for Unsteady Fluid Dynamics

FINAL SCIENTIFIC REPORT
Contract No. AFOSR 86-0[illegible] AFOSR.TR. 87-1788

Introduction

The purpose of this grant was to upgrade the data handling capabilities of the Turbulence Research Laboratory of the University at Buffalo, SUNY so as to enable it to better handle the increasing range of problems in which it is involved. Particularly benefiting from the procurement were the studies on the structure of turbulence free shear flows, the studies on the unsteady heat transfer and flow through gas turbines, and the studies related to flow around hypersonic vehicles. (The latter two programs are carried out in conjunction with CUBRC, the Calspan UB Research Center).

The Acquisition

The actual equipment purchased and the purchase prices are listed in the Appendix. The net expenditure was $199,747 of which $127,000 came from AFOSR and the balance from university resources leveraged by the AFOSR contribution. Because of the increased university contribution, from the original $30,000 promised, and because of special price breaks on the array processor hardware allowed by the vendor, it was possible to purchase the entire inventory originally proposed, in spite of a rather substantial budget reduction by AFOSR.

The Benefits

The principal advantage of the upgraded systems is that substantially more ambitious tasks can be undertaken. The upgrades to the Array Processor provide on-line vector processing, a real advantage in CFD code development. The enhanced data storage (three 500 M byte disks) allows complete experiments using proper orthogonal decomposition techniques to be performed in a reasonable and timely manner. The micro VAX workstation allows on-line graphics for rapid evaluation of test and calculated results.

Additional benefits from the upgrades and additions include full system and software compatability, fully implemented high speed intercommunication, and increased reliability.

All hardware and software is completely functional, and has been extensively utilized in research since December 1986.

APPENDIX

PDP 11/84 SYSTEM

1	11X84-BA	PDP 11/84 with 2 Mbytes of memory in a H9642 cabinet	21,000.00
1	RA81-EA	3 RA81 456 Mbyte disk drives with cabinet	42,000.00
1	UDA-50	RA81 Disk controller	4,620.00[1]
1	TU81-AA	1600/6250 BPI tape system with controller and cabinet	21,420.00
1	DR11-W	General purpose DMA interface	1,134.00
1	CK-DR11-LD	Cabinet kit for DR11-W	252.00
1	DHU11-M	16 channel programable asyn. MUX EIA w/mc	2,620.80
1	CK-DHU11-AF	Cabinet kit for DHU11-M	375.00
1	DELUA-M	UNIBUS to Ethernet Controller	2,751.00
1	CK-DELUA-KM	Cabinet kit for DELUA-M	189.00
1	H4000	Ethernet transceiver	252.00
1	BNE3A-40	40M Ethernet transceiver cable	210.00
1	QJ628-QZ	RSX-11M V4.2 documentation kit	895.00
1	QJ628-HZ	RSZ-11M Software right to copy update	665.00
1	QJ765-HZ	DECnet 11-M DECnet license	1,400.00
		PDP 11/84 system total	$99,783.80

[1] UB Contribution of disk controller

MicroVAX II SYSTEM

1	DH-630Q3-FA	MicroVAX II Processor	22,076.80
1	DEQNA-M	QBUS to Ethernet adaptor/controller	1,012.66
1	CK-DEQNA-KA	Cabinet kit for DEQNA-M	112.52
1	BNE3A-40	40 M Ethernet transceiver cable	210.00
1	H4000	Ethernet transceiver	252.00
1	QZ002-C5	8 User MVMS License and Key	3,000.48
1	QZ002-H5	MVMS Media and documentation kit	1,000.00
1	QZ004-UZ	DECnet VAX End node license	473.29
1	QZ100-UZ	VAX FORTRAN 77 license	2,325.37
1	QZ100-H5	VAX FORTRAN 77 Media and documentation kit	500.00
		MicroVAX II system total	$30,963.12

ARRAY PROCESSOR UPGRADE

2		FPS 164 Maxboard	30,000.00
1		$^1/_2$ Mwords FPS Memory	39,000.00
		Array Processor Upgrade total	$69,000.00[2]

[2] Special package price arranged between University at Buffalo Computing Services and Floating Point Systems by Dr. H. Martens, Director of Computing Services at U.B.

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